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"Business and Economy in Disruptive Era"
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FOREWORD

The papers contained in this proceeding are taken from the "**The 1st International Forum On Business And Economy – IFBE 2019**". Keynote speakers and authors of selected oral were invited to submit a manuscript for publication. The manuscripts were reviewed by the blind reviewers, and members of the editorial boards. The papers fulfill acceptable standard of scientific publication. The Steering Committee appreciates the contributions of all editors and reviewers in improving the quality of this proceeding.

In particular, I wish to express my warmest appreciation to the following people: Our distinguished keynote speaker, Dr. Arlyana Abubakar as Director, Bank of Indonesia. Prof. Dr. Raja Rasiah (University of Malaya), Abdy Taminsyah (President of MonsoonSIM) and Prof. Dr. M. Handry Imansyah, MAM (Regional Economist).

Banjarmasin, November 2019
Chairman,

Prof. Dr. M. Handry Imansyah, MAM

CONTENT

THE REINFORCEMENT OF DIGITAL-BASED RISK MANAGEMENT IN ISLAMIC BANK FINANCING IN THE DISRUPTION ERA

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Abstract: The existence of Islamic banks in the disruption era should be reinforced by accelerating financing process through an easier, more efficient and more effective application of risk management based on Islamic principles. This legal research aims to explore the regulation’s power of Islamic bank financing risk management and its application in BNI Syariah. The data was qualitatively analyzed using a systemic interpretation method. The results are; first, some regulations related to digital-based risk management of Islamic bank financing haven’t regulated credit scoring system. In addition, there is no fatwa from DSN-MUI concerning risk management guidelines of Islamic financing. Second, BNI Syariah financing starts applying digital-based risk management by screening process using Intranet LAN-based EFO (Electronic Financing Origination) application. By using this application, the history data of customer transaction connected to Financial Information Service System which (FISS/SLIK) managed by Financial Services Authority (FSA/OJK) will be easily recognized. Once the financing is given, the risk mitigation is operated in BNI Syariah through ICONS (Integrated and Centralized Online System) application using Intranet LAN for checking customers’ funds and debt transactions. Financing submission services are provided in offline, while the payment is provided in both offline and online (ATM, auto debit, mobile banking, and internet banking).

Keywords: *Risk management, Islamic bank financing, digital*

BACKGROUND

The dominance of innovative digital-based facilities have massively occured in order to fulfill the needs of modern humans who have high mobility. The mobility demands the efficiency of time, energy, facilities, and costs, in which everything can be closely related to the financial. Many digital services innovations independently evolve and openly compete each other to grab market share of all industrial areas with the goal of “winning” or “beating” so-called disruption era.(Prawirasasra, 2018)

Islamic bank as an Islamic-based intermediative financial institution, in this case, is faced with great threats and challenges to the presence of non-bank financial technology (fintech) industry. Financial technology (fintech) is a financial services innovation by using technology, so that people can easily access financial products and services as well as weaken the barrier to entry (Mlanga, 2019). Fintech provides digital-based financial services such as payment channel system (Au & Kauffman, 2008), digital banking, online digital insurance, Peer to Peer (P2P) Lending (Hariyana, 2019; Hendriyani & Raharja, 2019), and crowdfunding (Chang, 2018; Ferrarini, 2017). Then, it becomes a threat for Islamic banks when they are not able to transform into a digital-based bank like fintech. In terms of financing, fintech serves Peer to Peer (P2P) Lending by providing the convenience of efficient time and uncomplicated procedures for the application and disbursement of the loan. It is just done through online access without going to the office (*Indonesia’s Fintech Lending: Driving Economic Growth through Financial Inclusion—Executive Summary*, 2019; Yunus, 2019).

The opportunities and challenges show that fintech can be a bank partner. For example, in credit distribution, especially to the sector of Micro and Small Medium Enterprises (MSME). Also, it can improve the existence of Islamic banking in order to be more able to compete in financial markets either by accelerating the process of financing through an easier, more efficient and more effective application with a wider access by customer and Islamic bank. The process of financing is expected to be faster and more measurable by risk mitigation which can be initially done with fintech system.

The risks which require attention in the management of Islamic banking nowadays are in the aspect of financing. Some research results conclude that the financing of Islamic banks have more risks (Non Performing Financing/NPF) as compared with the credit of conventional banks (Non Performing Loan/NPL).(Iqbal, 2017) The reason lies in approval process of financing in the bank's internal or after the financing was granted by a different system between the NPF and the NPL. Islamic banks do not focus their business on making profit of credits. However, on a social sense which involves the NPL/NPF, Islamic banks tend to be higher than the conventional banks.(Ramlan et al., 2018) The use of digitization of financing through fintech will probably encounter the risks with the regulative supports of FSA and BI, and resources on Islamic bank itself as the reinforcer.(Yundi & Sudarsono, 2018)

FSA's commitment to running a grand strategy for the financial markets development of Islamic banking. It seeks to its new imaging which includes aspects of positioning, differentiation, and branding. Differentiation aspect has competitive advantage with various, transparent products and schemes, competent and ethical in finance, up-to-date and user friendly information technology, as well as the experts of Islamic finance investment. Service quality improvement program is also done by producing competent human resources and providing information technology to fulfill customers' needs and satisfaction. This program also aims to communicate the products and services of Islamic banks to them clearly and correctly while still fulfilling the Islamic principles (*Tentang Syariah*, n.d.). Several regulations have been defined by the FSA and BI. However, the coverage should be examined to the development of inclusive finance of Islamic banking in Indonesia, especially on the financing aspect which is expected to have minimal risk and adhere to the Islamic principles.

One of Islamic banks which has already used digital instrument for its services is Bank Negara Indonesia Syariah (BNI Syariah). This bank has won two awards from Infobank Award 2018 in the category of the Best Bank Syariah for five consecutive years with the assets above IDR 25 trillion, and the Best Bank Syariah with a very good performance in 2017 with the assets above IDR 25 trillion. Some indicators of the assessment are such on the aspects of asset quality, funding expansion, financing expansion, and the ratio of bad financing or non-performing financing (NPF). BNI Syariah is committed to improve the quality of financing, broadening customer-based transaction, and cooperating with the stakeholders to keep conducting Islamic financial literacy and inclusion, and developing technology through digital application (*BNI Syariah Raih Bank Syariah Terbaik dari Infobank | Republika Online*, n.d.). In accordance with the effort to reinforce financing risk management, BNI Syariah is interested to be the role model in the application and navigation areas of regulation's power in digital-based risk management of Islamic bank financing in Indonesia. It becomes the focus of this study.

LITERATURE REVIEW

2.1. Risk Management for Islamic Banking

Islamic Banking as one part of the state's economic system is expected to support economic development through the collection and distribution functions of public funds. To create a strong banking industry which has high competitiveness, it requires resilience in dealing with various risks. The ebb and flow of banking industry in Indonesia mainly occur during the global crisis in Asia in 1998, the impact of the crisis in America in 2008, and in the Europian region in 2011. Those crises give very valuable lesson to improve and reinforce the banking industry either by implementing the system of risk management (Ikatan Bankir Indonesia, 2018, p. 3-4).

The risk management, according to Arifin, is a series of procedures and methodologies used to identify, measure, monitor, and control the risks arising from banking operations(Arifin, 2009, p. 272). Risk management aims to: (1) provide information about the risks to the regulator; (2) ensure that the bank does not experience unacceptable losses; (3) minimize the loss of various uncontrolled risks; (4) measure the risks exposure and concentration; (5) allocate the capital and limit the risks (Karim, 2013, p. 255).

There are some regulations considered as the primary law and reference in the application of risk management, especially in Islamic banking industry occuring today, they are:

a. Law Number 21 of 2008 concerning Islamic Banking in Article 38;
b. Regulation of the Financial Services Authority No. 31/POJK.05/2014 concerning the Implementation of Islamic Financing Business; and
c. Regulation of the Financial Services Authority (POJK No. 65/POJK.03/2016) concerning the Application of Risk Management for Islamic Commercial Banks (ICB/BUS) and Sharia Business Unit (SBU/UUS).

Regulation of Islamic banking risk management in Indonesia adopts some rules contained in international standards which is Basel Committee on Banking Supervision (Basel) and Islamic Finance Services Board (IFSB).(Hidayati et al., 2018) Basel accord consists of Basel I (1988), Basel II (2004), Basel 2,5 (2010), and Basel III (2011), in which everything is related to setting standard of minimum capital which should be maintained by the bank. This efforts is done to preserve people's interest who keep their money in the bank (Ikatan Bankir Indonesia, 2018, p. 16-22). IFSB creates specific standards for Islamic financial industry in the world. The IFSB-1 has classified six risks to be managed by Islamic banking such as credit risk, investment risk, market risk, liquidity risk, rate of return risk and operational risk(Handayani, 2016).

Risk management is a series of procedures and methodologies used to identify, measure, monitor, and control the risks arising from overall banking operations (Article 1 Section (6) POJK 65/POJK.03/2016). The term 'risk' means the loss potency resulting from a particular case. The risk is uncertain, when there occurs an undesirable situation which can lead to a mismatch of the expected results that potentially cause a loss. The risks to be anticipated by Islamic banking either BUS or UUS as stated in the Article 5 of POJK include credit risk; market risk; liquidity risk; operational risk; legal risk; reputation risk; strategic risk; compliance risk; yield risk (rate of return risk); and investment risk (equity investment risk).

The scope of risk management of Islamic banking industry in Indonesia is conducted internally and externally. Internally, the implementation of risk management for BUS is conducted individually or by consolidation with its subsidiaries. UUS is conducted to all its business activities which is an integral part of risk management implementation in Conventional Banks (CB) (Article 2 Section (2) and (3)). For that, Islamic banks are required to establish supervisory agencies, they are: Risk Management Committee and Risk Management Unit (Article 18). Risk Management Committee of BUS consists of: 1. The majority of members of Directors. One of them is the director who is in charge of the compliance function; and 2. the corresponding executive officer, while UUS itself can establish the Risk Management Committee at least consist of: 1. The Director of UUS; 2. The director who is in charge of the compliance function of Conventional Banks (CB); and 3. the corresponding executive officer.

The external supervision is conducted by the Financial Services Authority since December 31, 2013. It was the duty of Bank Indonesia (BI) as the central national banking before the date. The supervision is conducted to ensure that the banks are rightly and carefully managed in accordance with the principles of risk management and good corporate governance (GCG), and to comply with the legislation and regulations applied, including compliance with Islamic principles. The supervision/inspection of a bank is focused on the inherent risks of the functional activity of banks and KPMR. Inherent risk is the risk inherent in bank's business activities, whether quantifiable or not and potentially affect financial position of the bank, including: 1) Financing Risk; 2) Market Risk; 3) Liquidity Risk; 4) Operational Risk; 5) Legal Risk; 6) Strategic Risk; 7) Compliance Risk; and 8) Reputational Risk. The risks are categorized into five ranks, namely 1 (*Low*), 2 (*Low to Moderate*) 3 (*Moderate*), 4 (*Moderate to High*), and 5 (*High*). By regarding to the risk, financing in Islamic banks is analyzed based on the quality of assets with 5 (five) categories: 1) current, 2) special concern, 3) less current, 4) doubtful, and 5) jammed.

2.2. Characteristics of Disruption Era

Etymologically, the term 'disrupsi' is derived from an English word *disruption*. In Indonesian language, it is basically defined as things being uprooted. Disruption is a term popularized by Clayton Christensen as a continuation of the tradition of thinking "must compete" aiming to win and beat others. In the dynamic and sustainable current development, we have arrived and entered to the era of disruption. This era is characterized by the use of real objects into the virtual object with the aid of technology such as computers, cell phones and robots. This digitization process happens due to the evolution of technology which is based on communication and information accompanying our daily life. Eventually, sooner or later, this may change the life order and lifestyles of people. In fact, disruption era reaps different responses; some companies regard it as a threat, but others see it as a great opportunity (2019, p. 9).

Disruption is when a fundamental or basic change happens. One of things that causes the fundamental change is the changes in technology targeting a gap in human life. Digitization is the result of technology changes that alters almost any order of life, including the order in doing business. Disruption era occurs when a new innovation comes into the market and creates a strong enough effect of disruption that changes the prior market structure. Disruption era gives the birth of industrial revolution 4.0 that we currently feel it as a big change in various aspects compared to the previous generation. Industrial revolution 4.0 is marked by the advancement of connectivity, interaction, limitations between people, machines and other resources which are increasingly being convergent through information and communication technologies (ICT). The ICT should be optimally utilized not only for the production process, but also for the whole industrial links; so that, it could generate a digital-based new model of business.

The phases of industrial revolution can be described as follows:

a. 1.0: the late 18th century, the mechanization of production with hydro and steam power;
b. 2.0: the late 19th and early 20th century with electrical technology; mass production through assembly line;
c. 3.0: the early 1970s, the automation of production through information technology;
d. 4.0: in 2018, it's marked by cyber-physical and virtual-connectivity, human, machine, and E-society; smart data (internet of things)-genetic editing, artificial intelligence, big data mining, and self-drive vehicles. By the industrial revolution 4.0 and E-Society, cyber technology integration occurs for the reproduction of science and technology with the internet of things; social skills are increasingly needed. (Azra, 2019)

There are two main characteristics of disruption. First, it is a very fundamental change related to business model. In fact, market leader company continuously innovates, but the innovation is more intended to maintain the growth and the market. Conversely, the new companies offer a new business model different from the previous ones. Second, disruption always begins at the lower market (low-end) by offering much cheaper prices. Since it initially serves the lower market, the company is not detected by market leaders which get more focused on the upper market (high-end). Sooner or later, when the company has a strong market foundation, they will improve their quality and lead to the upper market. Here is when the theory of disruption then predicts that a market leader company is going to lose (Christensen, 2006).

2.3. The Impact of Disruption for Banking

Deputy Commissioner of the Financial Services Authority (FSA/OJK) Institute, Sukarela Batunanggar, addresses the issues faced by banks if they do not make any changes in the era of technology disruption. Sooner or later, they will be affected if they just stay the same. Globally, almost 60 percent of banking portfolios later will be at risk, that is likely to decline if they do not consistently change. By digital transaction, digital business process will improve the efficiency. By digital services, the banks become more efficient, the customers feel more comfortable, and operating costs get (*Ini Dampak Disrupsi Teknologi ke Industri Perbankan—Bisnis Tempo.co*, n.d.). Professor of Management at UI, Prof. Dr. Rhenald Kasali, acknowledges the rapid technology disruption which is currently felt will have an impact on the sector of banking. It is because one of things mostly affected by industrial revolution 4.0 is the financial sector. The banking industry, according to him, is expected to adapt the technological developments which are now growing more rapidly (*Dampak Disrupsi Teknologi*, n.d.).

The flow of times which moves dynamically requires us not to deny the existence of technological advancement. Nowadays, people either personal or collective compete to create media that can simplify their jobs or can be used to ease what first looks difficult to do. Digital economy is one of results of disruption era. Economy with internet as the medium for various activities like communication, collaboration, and cooperation between companies or individuals can bring benefits and advantages for the economy itself. It includes the sectors of modern economy and financial institution which has been established among wide community Digitization demands for all sectors to move dynamically for the global competition with the high competitiveness of products and financial services. The competition between banks and financial institutions has got into the new stage of application technology which is the implication of banking business development in the era of digital economy.

In the era of digitization and automation, many office works can be more efficiently produced at lower costs. Digitization can be seen as an opportunity to improve customer relationship, business process, and to create and adapt new business models. In the financial sector, digitization is a development of work methods, scope of work and work environment. The advancement of information technology and computerization system which are developed into digitization can make the jobs more efficient and faster. The general consensus is that due to digitization, customers will become more independent and work environment turns into a more digital environment which may change the entire environment of the organization. Telecommuting and working remotely from the office will be more used as work methods of today and future; so that, digital competence becomes more important and becomes the need of peoplepowers.(Nurfalah & Rusydiana, 2019)

Islamic banking as one of the economic sectors which becomes a revolving wheel of funds in a country should evolve and follow the market needs. Islamic banking should always be the first choice of individuals in conducting the payments and other economic activities. To achieve that kind of targets and objectives, bankings must endlessly innovate in accordance with the needs, and make customers easier to carry out all their economic activities. Application technology in a banking is called by digital banking. It is a banking service by utilizing digital technology to meet customers' needs in order to actualize the digital economy as aspired. Digital bankings which have grown until today are like ATM, internet banking, mobile banking, video banking, phone banking and SMS banking. Several banks have already launched branchless financial services (branchless banking) which are mainly intended for people who have not the access to banking (unbanked).(Dz, 2018)

The transformation of digitizing Islamic banking services is a necessity. The anticipation is a legacy to survive. Business institutions may choose whether to be the player of the change or just to be the spectator of it. If the choice falls on being the player of the changes, they must be ready for mindset, role, and responsibility changes of a new job as well as to be ready to face new competitions and sciences. The high intensity of socialization by the Islamic banking can affect society in general. The functions contained get the attention and be able to attract new prospective customers while maintaining public trust to the Islamic banking. Internet facilities and various social media (Facebook, Twitter, Instagram, and others) can be utilized for the benefits of education and socialization of Islamic economy, especially Islamic banks. As it is known that Islamic bankc have different system and products from the conventional banks. In today's digital era, the forms of media have already switched to the online format because it is easily accessible by anyone who needs the information. People easily share informations about their social account as well.(Dz, 2018)

In addition to revolutionizing the approach taken by banking industries, the rapid growth of technology has also changed people's lifestyle, especially in complying their financial needs.

This results in the emergence of new businesses in the field of technology-based financial services. These financial services companies are often well-known as fintech companies. BI defines financial technology as the result of a combination between financial services and technology, in which then it changes the conventional business model to be moderate. At first, the customer should have a face-to-face transaction, but now it can be remotely done by making a payment.

2.4. Inclusive Islamic Finance Through Banking Digitization

The Consultative Group to Assist the Poor (CGAP-GPFI) defines inclusive finance as a condition in which all working age people are able to gain effective access to credit, savings, payment systems and insurance from all financial services providers. The effective access also includes the convenient and responsible services at an affordable price for the public and sustainable for the provider. It is expected that in the end, people can take more advantages of formal financial services than informal financial services (Nurfalah & Rusydiana, 2019) (anshori, 2016). Financial inclusion, based on the Presidential Decree (Perpres), is a condition in which every society member has the access to many quality, timely, streamlined, and safe formal financial services with an affordable price according to one's needs and capabilities (Attachment of Presidential Decree Number 82 of 2016 concerning the National Strategy for Inclusive Finance). Concurrently, in FSA regulation, financial inclusion is defined as the availability of the access to various institutions, financial products and services according to the needs and capabilities of people in order to improve their prosperity (Article 1 Paragraph 7 of the Financial Services Authority Regulation No. 76/POJK.07/2016 Concerning the Enhancement of Literacy and Financial Inclusion in Financial Services Sector for Consumers and/or Community).

Basically, inclusive financial policy is a form of financial services deepening addressed to the public "in the bottom of the pyramid" to take advantage of formal financial products and services as a safe means of keeping money, transfers, savings or loans and insurance. It's done not only by supplying products in an appropriate manner but also combining it with various aspects (*Program Keuangan Inklusif—Bank Sentral Republik Indonesia*, n.d.).

Inclusive finance is an important component in the process of social inclusion and economic inclusion which contribute to foster economic growth, create the stability of financial system, support the poverty reduction program, as well as to reduce the gap between individuals and between regions. Inclusive financial system is actualized through people's access to financial services that it can improve the economic capability and eventually pave the way to escape from poverty and reduce economic disparities. Wider access to financial services is essential in the effort to increase the participation of the whole society in economy.

The effort should be made to actualize and improve the inclusive Islamic financial by the digitization of Islamic banking industry (Megargel et al., 2018). Most of banking industry players have already switched to a digital strategy as a strategy implemented at the level of corporate strategy in Indonesia. According to the data from BI, recorded growth of the number of electronic money transaction nominal has increased by approximately 290% or 29 times since 2012 until the end of 2018. It happens unseparatedly from customers tendency who start enjoying electronic-based banking services. It can be seen from the increasing number of electronic transactions conducted by bank customers in Indonesia. According to the Price Water Cooper Survey, 44% of respondents from banking industry say that digital strategy has an ultimate goal to enrich customers and employees experience in doing a better process of banking. It is expected that they can conduct banking activities more easily because of the vary rapid technological development (Indira & Ertambang Nahartyo, 2018; Rapitasari, 2016) Digitization is based on big data and data analysis technology. The big data is used to create (1) the efficiency of risk management through credit scoring and the quality of decision; (2) protection of froud (deviation), that may lead to cyber security attack, with a data driven which can read anomaly patterns in a real time; (3) faster merchant assessment for the quality partners who are in need of funds (Dicuonzo et al., 2019).

2.5. Previous Studies

The previous studies closely related to this study are quite a lot and very helpful in mapping out the headings of this research; thus, it certainly has a difference from studies as below:

The study entitled *"Analisis SWOT Financial Technology (Fintech) Pembiayaan Perbankan Syariah Di Indonesia (Studi Kasus 4 Bank Syariah Di Kota Medan)"* is written by Ridwan Muchlis in At-Tawassuth Journal, Vol. III, No. 2, 2018.(Muchlis, 2018). This study examined the application development created by Islamic banking to take advantage of FinTech in efforts to accelerate the financing process; thus, it could ease the service to customers. However, the development of fintech application is proved to have some disadvantages. Such as, it needs an internet network supporting for the efficiency of financing activities in Islamic banks. In addition, they are cyber crime activities which reduce customers' interest to use the application. Based on the research analysis, it is suggested to prepare the regulations related to the financing of FinTech earlier. Therefore, the risks can be minimized, and customers can improve their knowledge and understanding for the transactions comfort and safety in Islamic banking.

The study entitled *"Analisis Perbandingan Risiko Kredit Antara Bank Syariah dan Bank Konvensional"* is written by Siti Ruwaida Ramlan, Silcyljeova Moniharapon, and Joy Elly in EMBA Journal Vol. 6 No. 1 January 2018.(Ramlan et al., 2018). This study examined whether there are differences in credit risk between Islamic banks and conventional banks. Based on the conclusions drawn in the research, it is mentioned that there are significant difference between the Conventional Banks and Islamic Banks, in which the value of NPL/NPF of Islamic Banks have a greater average than Conventional Banks.

The study entitled *"Risiko Kredit, Stabilitas, dan Kebijakan Pembiayaan Bank Syariah di Indonesia"* is written by Ahmad Syatiri and Yulia Hamdaini in the Journal of Management and Business Sriwijaya Vol. 15 (3), 2017 (Syatiri & Hamdaini, 2017). This study examined the relationship between credit risk, bank stability, and financing policy. The study found that the stability variable has significant relationship with the financing variable to deposit ratio. External variable in the form of inflation has significant relationship with stability, while BI Rate variable has significant relationship with *murabahah* financing (MBAF). However, credit risk variable have no significant relationship with all variables.

The study entitled *"Perbankan Era Baru Digital"* is written by Nurkholis in *Economicus* Journal Vol. 9 No. 1 June 2018 (Kholis, 2018). This study aims to determine the continuation of human resources who have been working in banking services such as customer service, teller and others. If the function has been replaced by a digital application, and then how is the security of customer transactions? In this transaction, services are done digitally without having the physical presence of customer in the bank branch office involved. In adddition, if the function has been replaced by digital application, how the regulations determined by Bank Indonesia and the FSA toward digital banking services. Based on this research, it could be inferred that technological development is unstoppable. The progress is directly proportional to human desires to get easy in every activity. For instance, in financial activities which daily interact with banking services directly. Conventional banking services do require a high cost, a substantial investment. However, with the development of technology, everything can be trimmed with FinTech. Initially, many perceived that FinTech will replace the position of bank in economic world. Somehow, today, instead of replacing the position of bank, the presence of FinTech can even walk side by side; so that, the progress of the economy can be done together. It is clear and unequivocal regulation which is the Financial Services Authority Regulation No. 77/POJK.01/2016 concerning Information Technology-Based Loaning Money Services regulates everything to protect community interests both as loaner or borrower. In addition, Bank Indonesia issued Governor Board Member Regulation No. 19/14/PADG/2017 concerning Financial Technology Regulatory Sandbox. In this regulation, the regulatory sandbox is defined as a safe limited test room to examine Financial Technology Administrator along with the products, services, technologies and/or its business model.

The study entitled *"Digitalisasi Keuangan Syariah Menuju Keuangan Inklusif: Kerangka Maqashid Syariah"* is written by Irfan Nurfalah and Aam Slamet Rusydiana in *Expansion: Journal of Economics, Finance, Banking and Accounting* Vol. 11, No. 1 May, 2019 (Nurfalah & Rusydiana, 2019). This study aimed to determine the solutions to improve the low levels of literacy and Islamic financial inclusion in Indonesia, the solutions are in accordance with the concept of *maqashid syariah,* and the implications toward Islamic finance. The study concluded: (1) the author provided solutions of digital innovation to increase the level of literacy and Islamic financial inclusion in Indonesia by creating the application "Connected, One Stop Solution". This application facilitated people with 20 features including: saving (plain tubes, gold tubes and Umrah Hajj tubes), investment (Islamic insurance, Islamic mutual funds and Islamic stocks) as well as to fulfill the obligation and donate (Zakat, Infaq, Sadaqah and Waqf); (2) Suitability of the 20 features of Connected with the concept of *maqashid sharia* (*dharuriyyah, hajiyat dan tahsiniyat*). *Maslahah dharuriyyah* was divided into 5 categories: a) Religion, b) Soul, c) Descendant, d) Mind, and e) Wealth. The features included in *maslahah dharuriyyah* were: a) Religion: Zakat, Waqf and Umrah Hajj tubes, b) Soul: Health Insurance, c) Descendant: Future Tubes, d) Mind: Educational Insurance and Future Tubes, and e) Wealth: Mutual, Stocks, Gold Tubes, Vehicle Insurance, Accident Insurance and Property Insurance. The features including *maslahah hajiyat* are Pay, Purchase, Cash WIthdrawal, Loan, Installment, Pawn, Resto, Travel, Scan QR and NFC as well as features including *maslahah tahsiniyat* are Add Friends, Chat and Rahma; (3) The implications of Connected application toward Islamic finance are to: a) Support Increasing Islamic Financial Inclusion, b) Improve the Literacy of Finance with the Digitization of Islamic Financial Services and Products, c) Improve Market Share of Islamic Finance, d) Support Government Program "Non-cash National Movement" and e) support halal needs in accordance with the *Maqashid Syariah.*

RESEARCH METHOD

This study was conducted in qualitative method by the form of empirical and normative juridical approach. The primary data were obtained from the interviews and the documentation from BNI Syariah. The secondary data were in the form of risk management regulation for Islamic banking and other supporting data. Both types of data were analyzed qualitatively using a systemic interpretation method.

RESULT

4.1. Regulatory Reinforcement of Digital-Based Risk Management of Islamic Bank Financing

Indonesia is a country with a large Muslim population with the composition of more than 85 percent of the whole population. Since the first time Islamic banking existed in Indonesia through Bank Muamalat in 1991, the penetration of Islamic financial assets is still around 5,9 percent of total national banking assets. Meanwhile, when it is combined with the non-bank Islamic financial industry, the total Islamic assets only reached 8 percent. If the economic activities, trade and people transactions which are rapidly growing has already been connected to the Islamic values, the Islamic financial will also grow stronger. One of many reasons for the slow growth of Islamic finance and economy is because of nonoptimal use of digital aspects. In the ecosystem of Islamic digital, there are Islamic banking, Islamic investment institutions, Islamic financing institutions, Islamic capital markets, Islamic insurance, E-Money, financial technology and any other digital services as a separate ecosystem in Islamic finance.

This year, the government has launched Indonesian Islamic Economy Masterplan (MEKSI) 2019-2024 as a continuation of Indonesian Islamic Financial Architecture Masterplan (MAKSI) by the Ministry of PPN/Bappenas starting from 2015. One of the points mentioned is about digitization of the financial sector. MEKSI recommended four major steps and strategies. First, strengthening the halal value chain by focusing on sectors which are considered potential and high competitiveness. Second, strengthening Islamic financial sector with a master plan outlined in previous Indonesian Islamic Financial Architecture Masterplan (MAKSI) and improving into this master plan. Then, the third sector is strengthening Micro and Small Medium Enterprises (MSME) as the main driver of halal value chain. The fourth, the reinforcement in the field of digital economy, mainly trade (e-commerce, market place) and finance (financial technology), so that it can support and accelerate the achievement of other strategies. MEKSI 2019-2024 is expected to boost the ranking of Indonesia in the Global Islamic Economy Index. Currently, Indonesia is in the top 10. Indonesia is still below Malaysia, United Arab Emirates, Bahrain, Saudi Arabia, Oman, Jordan, Qatar, Pakistan, and Kuwait (Kementerian Perencanaan Pembangunan Nasional/ & Badan Perencanaan Pembangunan Nasional, 2018).

The encouragement for developing digital banking has always been strived by the regulator involved. Besides the government through MEKSI 2019-2024, both Bank Indonesia (BI) as well as the Financial Services Authority (FSA) are also working on it by setting up the guidelines and policies to form a special task force. BI and the FSA also encourage and pursue the development of digital banking in this country.

BI has an important role in commanding the stability of the digital-based banking industry through fintech (*Financial Technology—Bank Sentral Republik Indonesia*, n.d.). Some effort has been in terms of payment, investment and risk management. In keeping the traffic order of payments related to FinTech settlement and clearing, BI ensures the protection of consumers, particularly regarding the confidentiality of consumers' data and information through cyber security network. Bank Indonesia guarantees the security and the traffic order of payment by acting as the facilitator, intelligent business analyst, assessment, coordinator, and communicator. BI becomes a facilitator in terms of land provision for payment traffic. Through cooperation with the authorities and international agencies, BI becomes an analyst for the businessmen related to FinTech. BI provides insight and guidance on how to create a safe and orderly payment system. BI also conducts monitoring and assessment toward any business activities involving FinTech with technological payment system. It is as well as keeping in touch with the authorities to continue supporting the existence of FinTech payment system in Indonesia. BI is also committed to support entrepreneurs in Indonesia by regularly providing guidance about the FinTech. In terms of investment and risk management, Bank Indonesia also requires every businessmen to stick to the macroprudential regulation, deepening of the financial markets, payment systems to support the cyber operations and security to keep consumers' data and information.

Welcoming the disruption era with the industrial revolution 4.0, the FSA has issued several policies and regulations concerning the digitization of banking sector, as in the following table:

Table 2.
Regulations Concerning Digital Banking-Based Risk Management in Indonesia

REGULATIONS	ABOUT
POJK No. 65/POJK.03/2016	Implementation of Risk Management for Islamic Conventional Banks and Islamic Business Unit
POJK No. 23/POJK.03/2018	Implementation of Risk Management for Islamic Rural Bank
POJK No. 38/POJK.03/2016	Implementation of Risk Management in the Use of Information Technology by Commercial Banks
POJK No. 12/POJK.03/2018	Implementation of Digital Banking Services by Commercial Banks
POJK No. 18/POJK.03/2017	Reporting and Requesting Debtor Information Through Financial Information Services System
SE-OJK No. 50/SEOJK.03/2017	Reporting and Requesting Debtor Information Through Financial Information Services System
SE-OJK No. 10/SEOJK.03/2019	Implementation of Risk Management for Islamic Rural Bank

The FSA understands the importance of digital banking for banks. To lead to the digital banking services, banking does require not a slight investment. Banks also need to build relationships between banking and telecommunications industries as well as to provide information security and harmonizing rules among regulators. The FSA formed a Task Force Digital Banking Team in 2016. Task Force Digital Banking Team of FSA has synergy with the institutions and state institutions, such as banks, the Ministry of Communication and Information, Directorate General of Population and Civil Registration of the Ministry of Home Affairs, as well as the Indonesian Financial Transaction Reports and Analysis Center (INTRAC). In addition, Task Force Digital Banking Team is holding the Criminal Investigation Agency of Indonesian National Police (Bareskrim POLRI), the Board of National Defense (Wantannas), Indonesian Telecommunications Regulatory Body (BRTI), National Desk Information Defense and Security Cyber (DK2ICN), Coordinating Minister for Political, Legal, and Security Affairs (Menkopolhukam), as well as the representatives of telecommunications companies and information security experts. From the results of the joint discussion, the FSA sees that some things need to get more attention to develop the digital banking services such as the importance of using single identity, which is electronic ID card (e-KTP) (Martowadjo, 2016, p.9).

According to the FSA, the use of e-ID card is important as customer's data base. BI also needs to prepare the reliable and capable infrastructure of information technology (IT), implement good risk management (Annaswamy, 2018), and provide business models which suit customers' needs in entering the digital banking businesses. On the other hand, banks also still require standardization and increased discipline of telecommunication implementation. Replacing the SIM card to support digital banking services, enhanced security, and adjustments to a number of regulations which is done by customer should be a concern. (Annaswamy, 2018).

The process of financing in Islamic banks as well as in conventional banks applies the process of screening. Screening in financing is done by customers feasibility analysis. This analysis aims to assess the customers who are eligible to receive financing from banks and the way of banks to minimize the occurrence of non-performing financing/financing problems which will be detrimental for them. The financing customer feasibility analysis is divided into two types by looking at what is being analyzed, they are qualitative analysis (willingness to pay) and quantitative analysis (ability to pay). The analysis of financing as part of the screening process is generally referred to the principle of 5 Cs, they are character, capacity, capital, condition, and collateral.

Besides screening, credit scoring or credit assessment in the credit and financing is also applied. It is a system or method used by banks or other financial institutions which is useful for determining whether a loan applicant is feasible or not to get financing. It is also calculated by using a specific formula (Yu & Cho, 2018). There are various factors which can damage a credit score such as: the late payment of installments (primary and margins) as well as the lack of credit references (Khusumawardani et al., 2016, p.49). Banks are encouraged to utilize the big data to complete the credit scoring or credit value determination process which will be given to the debtor. According to the Head of the Statistics Department of Bank Indonesia, Yati Kurniati, some banks, especially state-owned bank have already implemented big data for credit scoring and fraud detection by using the data and credit cards of the debtor. The utilization of big data to support the process of credit scoring is a complementary. Calculation of credit scoring with big data by banks uses the information such as the behavior of individuals who is not covered by financial informasion service system (FISS/SLIK). SLIK relevant provisions are stipulated in POJK No. 18/POJK.03/2017 and SEOJK No. 50/SEOJK.03/2017 Concerning Debtor Reporting and Information Through the Financial Information Services System ((OJK), 2017).

Credit scoring is used for the needs of internal banks analysis to strengthen the risk management on the behaviors of individual customers. The data in FISS are used to enter the calculation of bank credit risk monitored by the banks and the regulators (FSA or BI). Therefore, the data format of SLIK are arranged according to the needs of the regulators. From the side of Bank Indonesia, big data of banking has been used all this time to identify the vulnerabilities in financial system. It is done by monitoring the behavior of individual banks and analyzing systemic risk potentials arising from the linkages of the interbank payment system. BI also uses the text mining algorithms by proceesing the news media to do prioritization of the major risks source which can disrupt the financial system. The results of big data analysis are used to support the process of policy making in BI.

The providers of financing, in general, such as Islamic banks, Islamic bank financing institutions, Islamic pawnshops, Islamic micro financial institutions, credit unions and Islamic financing (KSPPS) use credit scoring to evaluate the potential risks in the financing distribution to their customers. It is done to minimize losses due to financing problems. Financing providers use credit scoring to determine who is eligible to receive the financing and how long the tenors are. The use of credit scoring before the approval and granting access to financing is a well-guaranteed system implementation. This is a forward direction in the Risk-Based Management system of Bank Indonesia. Financial credit management is the act of creating economic value to the company by managing the risks faced, especially the financing risk. To implement this act, it needs a recognition to the source of risks, measuring and handling it. The use of credit scoring is not limited to the banking industry. Other organizations such as government agencies and the private sector also conduct these techniques. Credit scoring has many similar methods with the data mining, which basically also uses similar techniques. Either FISS, credit scoring, or 5Cs principle in feasibility analysis of customers are the application forms of prudential banking principle in Islamic banking.

In addition to FISS regulation as a form of digital-based financing risk management, there is a POJK of digital-based risk management namely POJK No. 38/POJK.03/2016 concerning to Implementation of Risk Management in the Use of Information Technology by Commercial Banks. In this POJK, it is required for the banks to have policies, standards, and procedures of use information technology and apply them consistently and continuously. There is also a tolerance for the risk limit to ensure that all aspects of policies, standards, and procedures of using technology run optimally. This POJK also requires the banks to have policies, standards, and procedures on the process of information technology risk management. Besides, banks are also required to conduct the risk management process related to the use of information technology. If the bank uses the service providers of information technology, the banks should ensure that they apply risk management as set out in the regulations of FSA. This POJK mandates that banks effectively implement the internal control systems of all aspects of the use of information technology. The control system is the supervision, the control culture, identification and risk assessment, control activities and functions separation, information systems, accounting and communication systems, monitoring activities and correction of irregularities which are committed by the management, the operational unit, internal auditing unit or any other parties.

Concerning the existing regulations, it seems necessary to formulate the regulation of the FSA in the disruption era related to Credit Scoring System. The implementation might be done internally or involves the third party which is the credit rating evaluation institutions from both government and private institutions. Besides, there should be regulations governing the use of integrated big data. By this regulations, the digital-based risk management will be ideally implemented in juridical, economic and technical aspects.

If it is correlated with the existence of Islamic digital banking ecosystem, there should be a different regulation from conventional banking. It includes in the digital-based financing risk management which must be leaning on the fatwa of DSN MUI. As it is known that fatwa of DSN MUI is ideological foundation in which transaction policies carried out are not contrary to the Islamic principles. DSN-MUI has issued a Fatwa DSN NO: 116/DSN-MUI/IX/2017 concerning Islamic electronic money, but it is still limited to the technical arrangements of financial products. It has not loaded the digital-based risk management. Thus, it is necessary to have Fatwa from DSN MUI related to the general guidelines of Islamic-based risk management and specific provisions on the risks of digital financial products. This fatwa is needed in order to be the fortress in maintaining a comprehensive Islamic financial ecosystem.

4.2. Digitization of Financing in BNI Syariah

BNI Syariah which was originally an Islamic Business Unit of Conventional BNI has very varied and innovative financial products. It is as the influence of the main bank which has longer taken part in the banking industry in Indonesia since 1946. In general, the financing offered by BNI Syariah consists of consumptive financing and productive financing with details as follow:

Table 1.
Products, Akad and BNI Syariah Financing Guarantee

Type of Financing	Product name	Contract
Consumptive	Multipurpose iB Hasanah	Murabahah
	Oto iB Hasanah	Murabahah
	Gold Financing iB Hasanah	Murabahah
	CCF iB Hasanah	Murabahah
	Griya iB Hasanah	Murabahah
	Flexion iB Hasanah Umroh	Multiservice Ijarah
Productive	Micro Rahn	Rahn
	Micro 2 IB Hasanah	Murabahah/Musyarakah/Mudharabah
	Micro 3 IB Hasanah	Murabahah/Musyarakah/Mudharabah
	Entrepreneurial iB Hasanah (WUS)	Murabahah/Musyarakah/Mudharabah
	Currency iB Hasanah	Customized needs of prospective customers
	Marketing cooperation with motor vehicle dealers	For dealers: Mudharabah For the end user: murabaha
	Smale Enterprises iB Hasanah (TUS)	Murabahah/Musyarakah/Mudharabah
	Small Business iB Hasanah	Murabahah/Musyarakah/Mudharabah
	Linkage Program Cooperation iB Hasanah	For LKS: mudharabah/musyarakah For the end user: the murabahah/mudharabah/musyarakah/Ijarah
	Multifinace corporate financing	Musyarakah/murabahah
	Export iB Hasanah	Murabahah/Musyarakah/Mudharabah
	Onshore iB Hasanah	Murabahah/Musyarakah/Mudharabah
	Syndication iB Hasanah	Musyarakah/ Mudharabah
	Kopkar Cooperation/Kopeg iB Hasanah	For cooperations: Mudharabah For the end user: Murabaha

Source:http://www.bnisyariahal.co.id/kategori-produk/produk-pembiayaan accessed on October 5, 2018

Director of Finance and Operations of BNI Syariah, Wahyu Avianto, stated that this year (2019) BNI Syariah is committed to perform digital development for halal ecosystem with several strategic steps. These steps are expected to anticipate the risk of disruption which can potentially lead to a deterioration of business, namely:

1. BNI Syariah is joined as a member of AFSI (Association of Indonesian Islamic Fintech) while supporting the need to use features of bank payment/transfer used by the startup/fintech to support the development of Islamic halal ecosystem.
2. Collaborate with Islamic Fintech such as PT. Ammana Fintech Syariah to deliver solutions of Digital Wakaf. This collaboration aims to encourage public participation toward the productive endowments in order to build a better Indonesia. Dissemination is done to the public about the ease of Ammana platform for doing the endowments through 23 Nadzhir (Endowments Institute) which is joined as a member of the Productive Endowments Forum. (BNI Syariah, 2019)

The quality of BNI Syariah assets until the second quarter of 2019 has experienced a positive growth. In Quarter 1 of 2019, BNI Syariah recorded that the finance distribution is IDR

29,4 trillion or has increased 23,9% compared to the same period in 2018 with IDR 23,7 trillion. The increase reaches double digits in the realization of the non performing financing (NPF) gross maintained in 2,9% or decreased from the same period in 2018 of 3,18%. The dominating financial sector is commercial financing, followed by microfinance, SME, consumer and hasanah card until March 2019 (*Laba Bersih BNI Syariah Triwulan 1 2019 Naik 43,26% yoy*, n.d.). However, this is still a positive performance. In the second quarter, BNI Syariah recorded assets amounting IDR 42,49 trillion, growing for 12,50% and the net income is IDR 315,27 billion, growing for 55,32%. This is, according to the Director of BNI Syariah, Abdullah Firman Wibowo, backed by a good financing expansion and optimal ratio of cheap funds. A commitment to maintain the quality of financing is indicated by the ratio of Non Performing Financing (NPF) of BNI Syariah until June 2019 amounted to 3,03 percent while maintaining the adequate level of financing provisioning with Coverage Ratio at 91,39% (*BNI Syariah Bukukan Kinerja Positif di Triwulan II 2019, Laba Bersih Tumbuh 55,32%*, n.d.).

Credit risk management applied in BNI Syariah is preceded by screening in the way of customer feasibility analysis before financing was provided. It consists of an analysis toward the capacity of potential recipients of financing individually (character) or based on the revenue and its business (capacity, capital, condition), as well as the assessment of the collateral (if it's necessary, although basically guarantee/collateral is only as a complement to the financing agreement). At this stage, BNI Syariah uses the application EFO (Electronic Financing Origination) via intranet LAN connected throughout all BNI Syariah branch offices which is accessible only internally for the manager of finance filing. EFO can know historical data of customer transactions connected with Financial Information Services System (FISS) managed by the FSA.

The feasibility assessment for financing receiver carried out by BNI Syariah is in accordance with the mandate of Article 23 Section (1) of the Law concerning Islamic Banking. In this mandate, Islamic Banks should have feasibility analysis of funds distribution prior to provide the financing until they have the confidence in willingness and ability of potential customers receiving the facility to repay all obligations on time. The data of debtors may be requested to the FSA through FISS in accordance with the provision of POJK No. 18/POJK.03/2017 and SEOJK No. 50/SEOJK.03/2017 Concerning Reporting and Requesting Debtor Information Through Financial Information Services System. In Article 15 Paragraph 4 POJK No. 18/POJK.03/2017, it is regulated that debtors information can be requested to the FSA by online through FISS. The information should include the debtor's identity; the owners and the managers for the debtor of an enterprise; the facilities of funds provision received by the debtor; collateral; guarantors; quality of the funds provision facilities; and other information (Article 14 Section (2)). The requests for debtors information should be in order to support the smooth process of financing, implement risk management and/or identify the quality of the debtor to fulfill the provisions of the FSA or other authorities.

Financing application process is still done by offline. It's not yet available online services like Feer to Feer Lending which is done by fintech industry. It is done because Islamic banks are bound by the principle of prudence (prudential banking) which insists on the fulfillment of the 5 Cs principle, they are character, capacity, capital, condition, and collateral. Thus, by direct meeting, Islamic banks will be convinced to provide financing to the customers (Interview with Andri Saputra (BNI Syariah Branch Sales Officer in Banjarmasin) and Ahmad Syarifuddin (Sales Asisstant of BNI Syariah Branch in Palangkaraya) on October 17, 2019).

Once financing is granted, risk mitigation is still being conducted in BNI Syariah through ICONS (Integrated and Centralized Online System) application using Intranet LAN for checking funds transactions and debt transactions of the customer. Customers can open an account by online via "e-form hasanah online" in https://bro.bnisyariah.co.id/home as one of requirements of the financing. Credit installment payments can be made by cash deposit through ATM or teller or by being debited through customer account, and digital payments can be made via mobile banking, ATM transfer, and internet banking. According to Syarifuddin, so far, the use of financing digitization in BNI Syariah run very smoothly and there is no significant obstacle, even he stated that it gets very easier to manage financial risk.

Based on the description above, it can be concluded that BNI Syariah has used digital-based financing system in order to mitigate the risks of financing; so that, it can significantly reduce the NPF, and it keeps the quality of positive assets in the current position as well.

CONCLUSION

Disruption era demands Islamic banking institutions, one of them is BNI Syariah, to inclusively perform the digitization of financing which needs to be reinforced by the FSA regulations regarding Syariah-based risk management leaning on fatwa from DSN-MUI. In this case, fatwa from DSN-MUI needs to be formulated regarding general guidelines of digital-based risk management within the frame of Syariah, especially with regarding to credit scoring. The credit scoring needs to be applied through the product of the FSA regulations. The synergy between the FSA, BI, and DSN-MUI needs to be done and maintained by involving other stakeholders such as the National Committee for Islamic Finance (KNKS) as a board in charge to actualize MEKSI 2019-2024, and also the organizations of Islamic economy drivers such as the Islamic Economy Community (MES), the Indonesian Association of Islamic Economist (IAEI), the Indonesian Association of Islamic Banks (Asbisindo), and any other Islamic economy movement organizations for the advancement of inclusive Islamic banking in Indonesia.

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